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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,105	01/17/2002	Jianwei Liu	50103-433	5730

7590 09/26/2003

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EXAMINER
BARRECA, NICOLE M

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,105	LIU ET AL.	
	Examiner	Art Unit	
	Nicole M. Barreca	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *19 and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,14-16 and 18* is/are rejected.

7)☒ Claim(s) *12,13 and 17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Applicant's election of Group I, claims 1-18 in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 19-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **with out** traverse in Paper No. 5.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 4, 7-9 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babich (US 5,830,332) in view of Kataoka (US 4,518,6756).

5. Babich teaches a method for the deposition of amorphous hydrogenated carbon films that may be used as a coating in magnetic memory devices such as a recoding magnetic disk (col.2, 33-37). A blanket amorphous carbon film 70 is deposited on the surface 72 of substrate 74. A thin metal layer 76 of Al, Cr or Ti, is deposited on top of the amorphous carbon film. Photoresist 78 is spun onto the structure, exposed and developed (wet chemical etch). The metal is patterned with a wet or dry etch and the

amorphous carbon is etched to from pattern 82. The resist is stripped and metal layer is removed with a wet chemical etch (col.11, 13-29).

Babich is silent on how the photoresist mask is stripped and does not disclose that the resist is stripped with a wet process or that the resist is stripped with plasma etch or ash. Kataoka teaches that conventionally photosensitive polymers resists, such as polymethyl methacrylate (PMMA), are stripped from substrates using a wet process of acid, peroxide or organic solvent or a dry process of oxygen plasma (col.1, 10-16). It would have been obvious to one of ordinary skill in the art to strip the resist layer in the method of Babich using a wet process or to strip the resist with oxygen plasma because Kataoka teaches that these are both conventionally processes used in the art to strip photoresists.

Babich does not disclose that the thin metal layer of Al has a thickness of about 10-200 angstroms. However the thickness is a result effective variable which is dependent on the final product desired and processing conditions being used during its production. It would within the ordinary skill of one in the art to determine the optimal thickness for the thin metal layer in the method Babich by routine experimentation and to have the thickness be about 10-200 angstroms, if required, because the discovery of an optimum value of a result effective variable is ordinary within the skill of the art, as taught by *In re Boesch* (617 F.2d 272, 205 USPQ 215 (CCPA 1980)).

6. Claims 2-3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babich in view of Kataoka as applied to claim 1 above, and further in view of Howard (US 5,436,047).

7. The teachings of Babich and Kataoka have been discussed previously. The references are silent on the final product being formed and do not disclose that the substrate comprises a plurality of thin film layers covered by the carbon-containing protective overcoat layer, or that these layers include a magnetic layer for the manufacture of a recording medium. Babich however does teach that the amorphous hydrogenated carbon films may be used in coating magnetic memory devices such as a recoding magnetic disk. Howard teaches that thin film metal alloy magnetic recording disks typically comprise a substrate, a NiP surface coating, a Co based magnetic layer and a protective overcoat of an amorphous hydrogenated carbon film (col.1, 61-68). It would have been obvious to one of ordinary skill in the art to include a plurality of coatings, such as a surface coating and a magnetic layer on the substrate underlying the protective overcoat of an amorphous hydrogenated carbon film in the method of Babich (in view of Kataoka), if the final product desired is a recording disk, because Howard teaches that these layers are typically formed in the manufacture of magnetic recording disks.

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babich in view of Kataoka as applied to claim 1 above, and further in view of Chou (US 5,772,905).

9. The teachings of Babich and Kataoka have been discussed previously. Babich is silent on the photoresist used and does not disclose that the resist is a carbon containing resist material, such as a thermoplastic resist. Chou teaches a high resolution, high throughput, low cost patterning method that uses a thermoplastic

polymer, such as PMMA, as the resist material (col.3, 27-36, col.4, 50-59). It would have been obvious to one of ordinary skill in the art to use a thermoplastic material such as PMMA as the resist material in the method of Babich (in view of Kataoka) because Chou teaches that this will produce high resolution patterns at a low cost.

10. Claims 2, 3, 5, 6, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babich in view of Kataoka as applied to claim 1 above, and further in view of applicant's admitted prior art.

11. Claims 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Babich in view of Kataoka and the applicant's admitted prior art.

12. The teachings of Babich and Kataoka have been discussed previously. The references are silent on the final product being formed and do not disclose that the substrate comprises a plurality of thin film layers covered by the carbon-containing protective overcoat layer, or that these layers include a magnetic layer for the manufacture of a recording medium (cl.2,3,11, 16 (a)). However the applicant teaches that this is known in the art in the disclosure of the Background of the Invention (p.3, 11-22, p.4). The references are silent on the photoresist used and do not disclose that the resist is a carbon containing resist material, such as a thermoplastic resist (cl.5, 6, 16(c)). However the applicant teaches that this is known in the art in the disclosure of the Background of the Invention (p.5-6). The references do not disclose selectively ion irradiating or implanting the portions of the substrate to alter the magnetic properties (cl.10, 16(e)). However the applicant teaches that this is known in the art in the disclosure of the Background of the Invention (p.7-8). It would have been obvious to

one of ordinary skill in the art to have the substrate comprises a plurality of thin film layers covered by the carbon-containing protective overcoat layer, or that these layers include a magnetic layer for the manufacture of a recording medium, to use a resist that is a carbon containing resist material, such as a thermoplastic resist, and to selectively ion irradiating or implanting the portions of the substrate to alter the magnetic properties because the applicant's admitted prior art teaches that these process steps are all known in the art.

Allowable Subject Matter

13. Claims 12-13 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

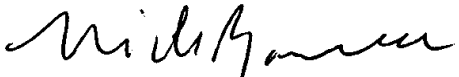
14. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest a method for patterning a carbon containing substrate, such as in a method for making a patterned recording medium, wherein the resist mask and the underlying thin metal layer are removed in a single step stripping process utilizing a wet chemical etch of an aqueous solution of base for the thin metal layer which undercuts and lifts off the resist mask.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 703-308-7968. The examiner can normally be reached on Monday-Thursday (8:00 am-6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Nicole Barreca
Patent Examiner
Art Unit 1756

9/22/03